



S5515

Version 1.1a

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Before you begin...

Check the box contents!

The retail motherboard package should contain the following:

	1 x S5515 Motherboard
	6 x SATA Cable
	1 x COM dual-port Bracket Cable
	1 x USB dual-port Bracket Cable
	1 x IO shielding
	1 x S5515 User's manual
	1 x S5515 Quick reference guide
	1 x TYAN® Driver CD

IMPORTANT NOTE:

Sales sample may not come with the accessory listed above.

Please contact your sales representative to help order accessory for your evaluation.

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S5515 motherboard, based on the Intel® Q67 and Nuvoton NCT5577D chipsets. The S5515 is designed to support single Intel® Core i3/i5/i7 series processor, and up to 32GB of un-buffered non-ECC 1066/1333MHz DDR3 memory. Leveraging advanced technology from Intel®, the S5515 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S5515 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provides the S5515 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at <http://www.tyan.com>. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

1.2 Hardware Specifications

TYAN S5515 (S5515AG2NR)

Processor	Supported CPU Series	Intel Core i3/ i5/ i7 32nm / 22nm series processor
	Socket Type / Q'ty	LGA 1155/ (1)
	Thermal Design Power (TDP) wattage	Max up to 95W
Chipset	PCH	Intel Q67
	Super I/O	Nuvoton 5577D
Memory	Supported DIMM Qty	(4) DIMM slots
	DIMM Type / Speed	Unbuffered Non-ECC DDR3 / 1600*/1333/1066 *22nm Ivy bridge Support
	Capacity	Up to 32GB
	Memory channel	2 Channels
	Memory voltage	1.5V
Expansion Slots	PCI-E	(1) PCI-E Gen.2 x1 slot / (1) PCI-E Gen.2 x8 slot (w/ x4 link) / (1) PCI-E Gen.2/Gen.3 x16 slot
	Note:	use Intel Ivy Bridge CPU to support PCI-E Gen.3
	PCI	(1) PCI 32-bit slot (5V)

LAN	Port Q'ty	(2)
	Controller	Intel 82583
	PHY	Intel 82579
Storage	SATA	Connector (6) SATA
		Controller Intel Q67
		Speed (2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (black color)
		RAID RAID 0/1/10/5 (Intel RST)
Graphic	Connector type	D-Sub 15-pin / DVI-D / Display port 1.1 / Only two video outputs at the same time
	Resolution	Up to 1920x1024
	Chipset	Intel Q67
Audio	Chipset	Realtek ALC888
	Feature	High Definition Audio
Input /Output	USB	(9) USB2.0 ports (4 at rear, 4 via cable, 1 type A onboard), (2) USB3.0 ports (NEC, uPD720200)
	COM	(4) headers
	VGA	(1) D-Sub 15-pin VGA port / (1) Display port 1.1
	DVI	(1) DVI-D connector
	Audio	LINE_IN, LINE_OUT, MIC_IN connectors
	RJ-45	(2) GbE ports
	Power	SSI/ATX 24-pin + 4-pin power connectors
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(4) SATA-II and (2) SATA-III connectors
System Monitoring	Chipset	Nuvoton 5577D
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (3) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
BIOS	Brand / ROM size	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	Form Factor	Micro ATX
	Board Dimension	9.6"x9.6" (243.8x243.8mm)
Operating System	OS supported list	Please visit our Web site for the latest update.
Regulation	FCC (DoC)	Class B
	CE (DoC)	Yes

Operating Environment	Operating Temp.	0° C ~ 55° C (32° F ~ 131° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	RoHS 6/6 Compliant	Yes
Package Contains	Motherboard	(1) S5515 Motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable	
	SATA	(6) SATA signal cables
	Others	(1) COM dual-port bracket cable

1.3 Software Specifications

For OS (operation system) support, please check with TYAN® support for latest information.

NOTE

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right... the first time

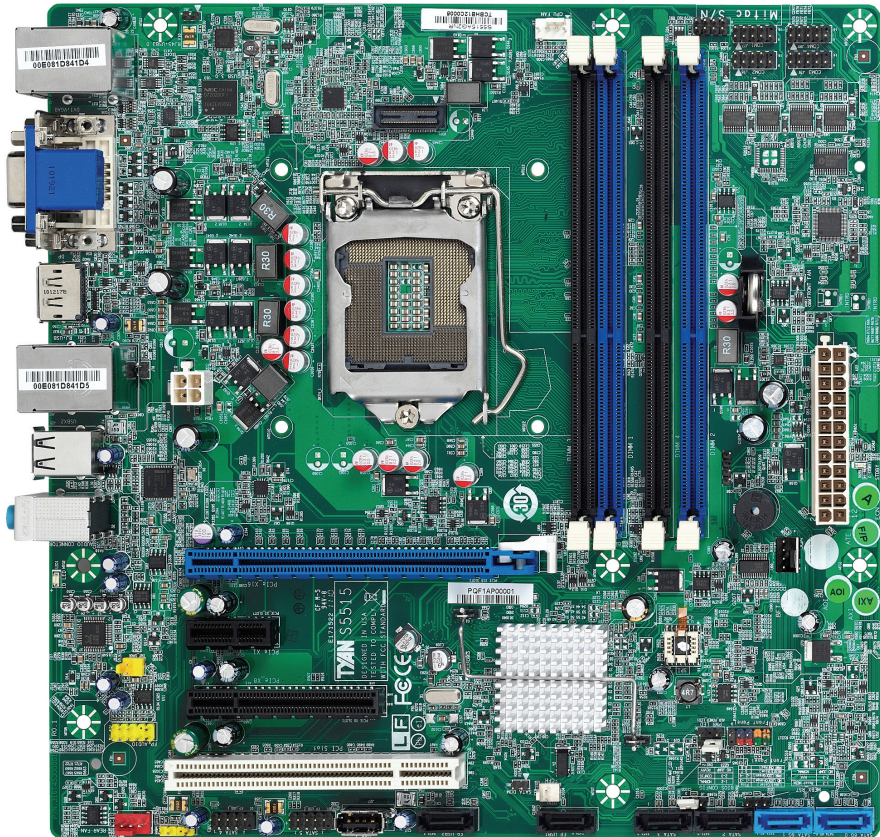
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
- (2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
- (4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

NOTE: Do not apply power to the board if it has been damaged.

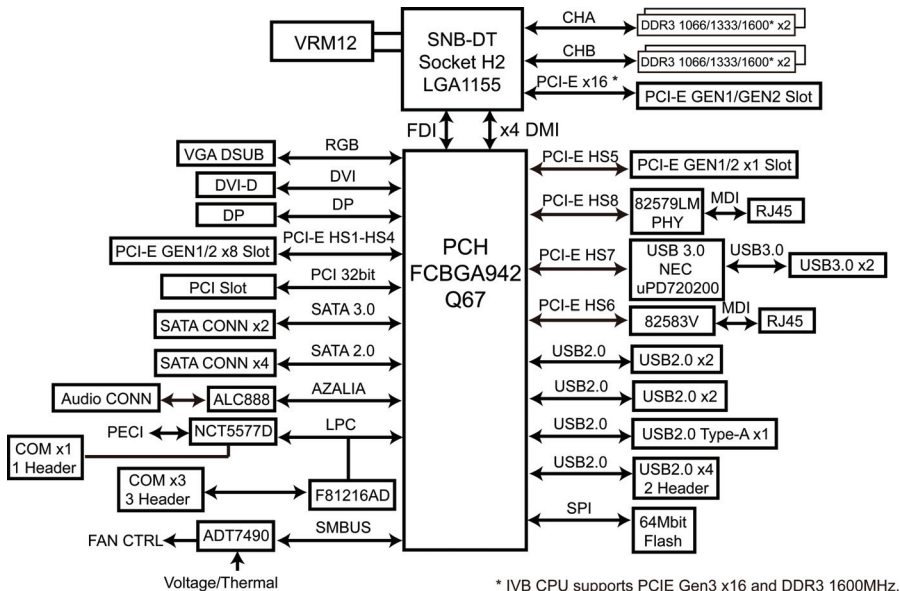
2.1 Board Image



S5515

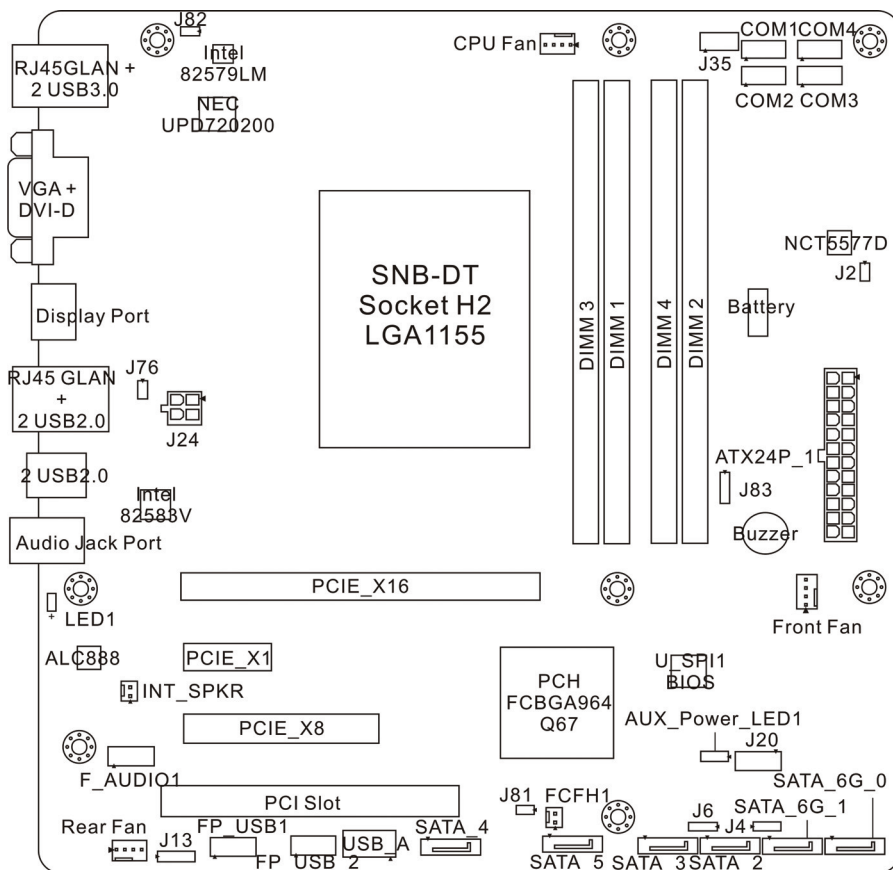
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

2.2 Block Diagram



S5515 Block Diagram

2.3 Board Parts, Jumpers and Connectors





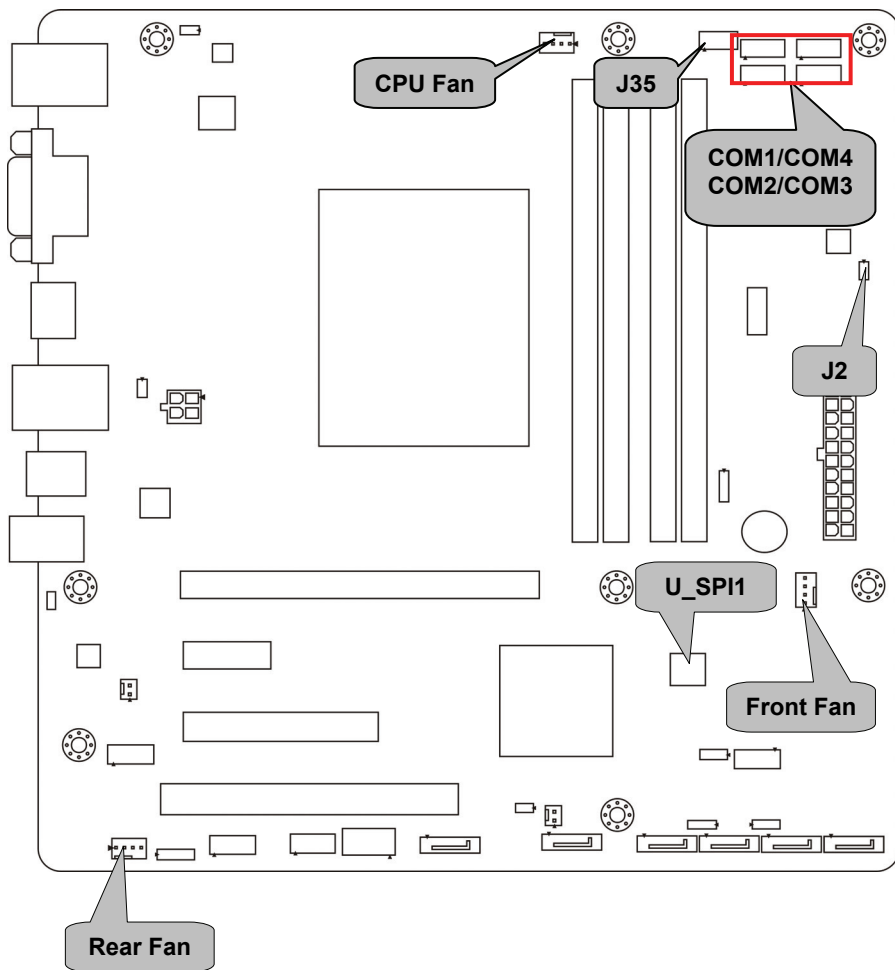
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. But for the DIMM number please refer to the above placement for memory installation. For the latest board revision, please visit our web site at <http://www.tyan.com>.

Jumpers & Connectors



Jumper/Connector	Function
Rear Fan/CPU Fan/Front Fan	4-pin Fan Connector
SATA_6G_0/SATA_6G_1	SATA3.0 Connector
SATA2/SATA3/SATA4/SATA5	SATA2.0 Connector
COM1/COM2/COM3/COM4	COM Port Header
J35	APS Header
J2	ID LED Switch Header
J20	Front Panel Header
J82	FP 82579 LAN Activity LED Header
J76	FP 82583 LAN Activity LED Header
INT_SPKR	Internal Speaker Header
J4	CMOS Clear Jumper
F_AUDIO1	Front Audio Connector
U_SPI1	BIOS SPI ROM Header
FCFH1	Chassis Intrusion Header
J81	SATA DOM 2-pin Header
J6	ME Header
J13	SPDIF Header
J83	Speaker Header
FP_USB1/2	Front USB Connector
LED1	ID LED
AUX_Power_LED1	Aux Power LED 3-pin Header
USB_A	Type-A USB Connector

Jumper Legend

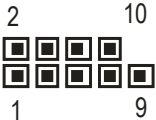
	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover



Front Fan/CPU Fan/Rear Fan: 4-Pin FAN Connector

 	Pin	1	2	3	4
	Signal	GND	VCC	Tachometer	PWM
	Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.				


COM1/COM2/COM3/COM4: COM Port Header

	Signal	Pin	Pin	Signal
	DCD	1	2	DSR
	RXD	3	4	RTS
	TXD	5	6	CTS
	DTR	7	8	RI
	GND	9	10	KEY-Pin

J35: APS Header

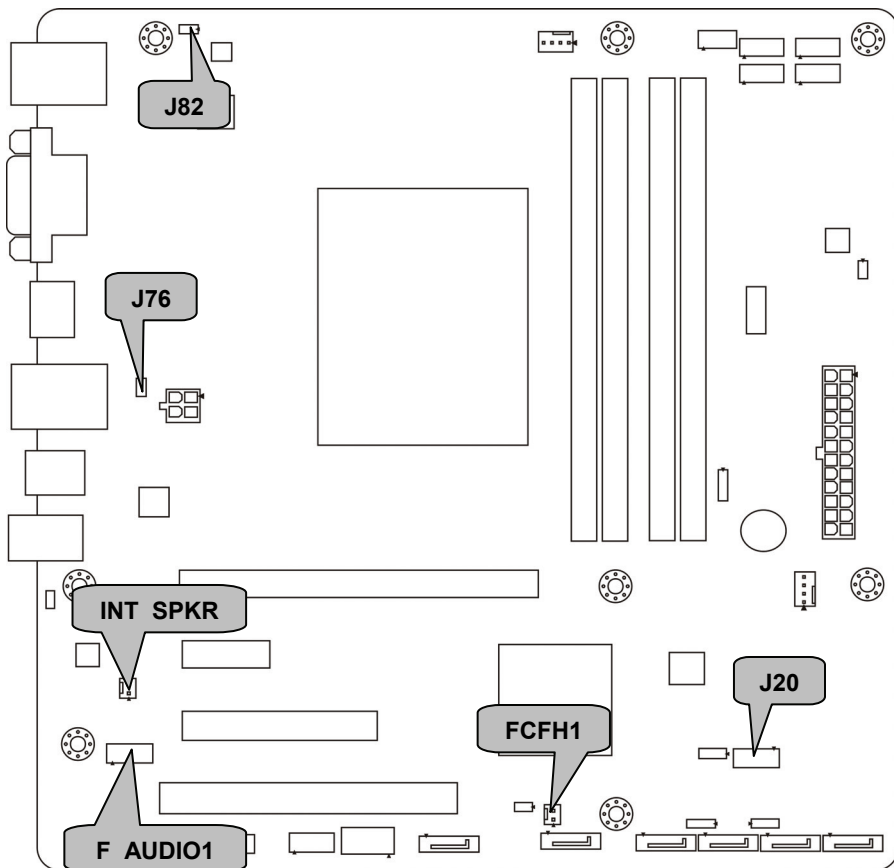
	Signal	Pin	Pin	Signal
	3VSB	1	2	SLP_S3
	SLP_S4	3	4	3VSB
	SLP_A	5	6	SLP_SUSB
	GND	7	8	VCC3

J2: ID LED Switch Header

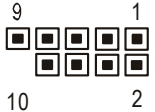
	Pin	1	2
	Signal	FP IDLED Switch	GND

U_SPI1: BIOS SPI ROM Header



	Signal	Pin	Pin	Signal
	SPI CS	1	2	3.3V Standby
	SPI MISO	3	4	SPI HOLD#
	SPI SP#	5	6	SPI Clock
	GND	7	8	SPI MOSI




J20: Front Panel Connector

	Signal	Pin	Pin	Signal
	VCC	1	2	GRN BLNK HRD
	SATA LED	3	4	YLW BLNK HRD
	GND	5	6	PWRBTN
	FP_RST	7	8	GND
	VCC	9	10	KEY-Pin

FCFH1: Chassis Intrusion Header

 1	Use this header to disable the system chassis intrusion alarm.
 1 (Default)	Use this header to trigger the system chassis intrusion alarm.

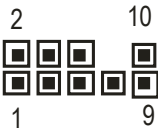
J76: 82583 LAN Activity LED Header

 1	Signal	Pin	Pin	Signal
	VCC3	1	2	82583_LED_ACT-


J82: 82579 LAN Activity LED Header

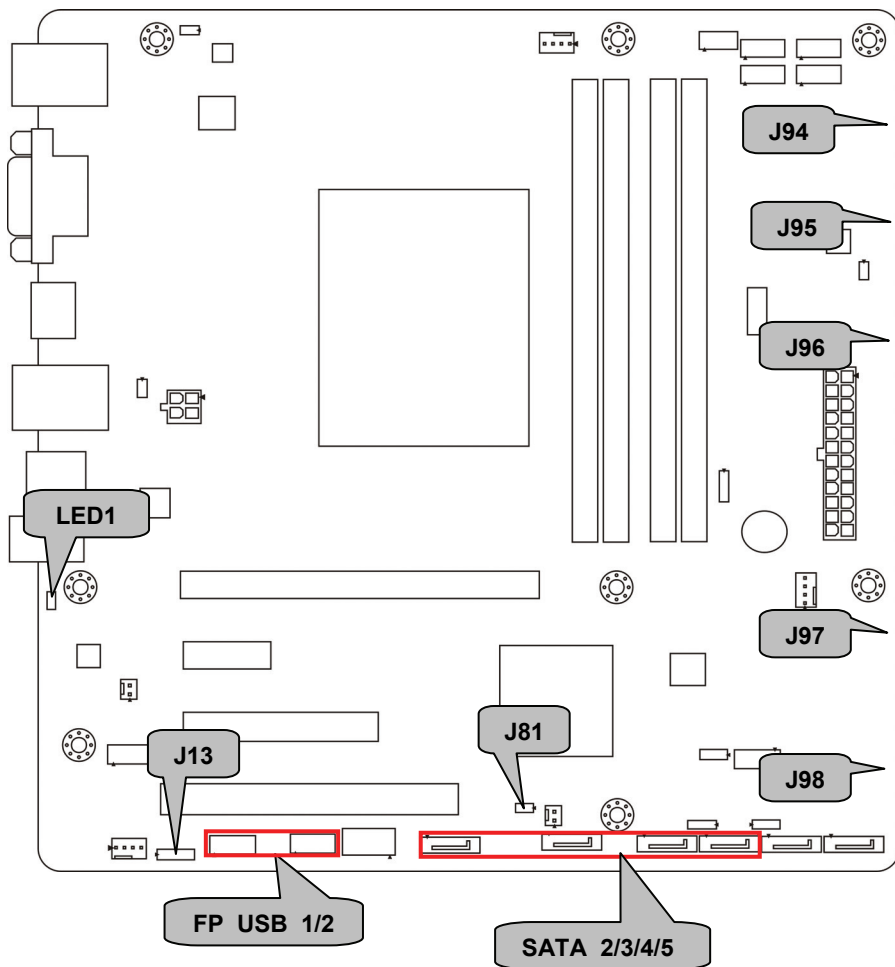
 1	Signal	Pin	Pin	Signal
	VCC3	1	2	LAN1_LINK_ACTIVITY-

F_AUDIO1: Front Audio Connector


	Signal	Pin	Pin	Signal
	FP_MIC_L	1	2	AGND
	FP_MIC_R	3	4	AUDIO_Detect
	AUO_HPOUT_R	5	6	AUO_SENSE_MIC
	FIO_SENSE	7	8	KEY-Pin
	FP_MIC_L	9	10	AUO_SENSE_HP

INT_SPKR: Internal Speaker Header

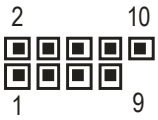
 1	Signal	Pin	Pin	Signal
	INT_SPKR-	1	2	INT_SPKR+




J81: SATA DOM 2-pin Header

	Signal	Pin	Pin	Signal
	VCC	1	2	GND


FP_USB1/FP_USB2: USB Front Panel Connector

	Signal	Pin	Pin	Signal
	VCCUSB	1	2	VCCUSB
	USB_DN0	3	4	USB_DN1
	USB_DP0	5	6	USB_DP1
	GND	7	8	GND
	KEY-Pin	9	10	NC


LED1: ID LED

	Pin	Signal	
	+	P3V3_AUX	
	-	ID_SW_L	
	State	Color	Description
	On	Blue	System identified
	Off	Off	System not identified

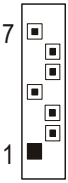
USB_A: Vertical (Type A) USB Connectors

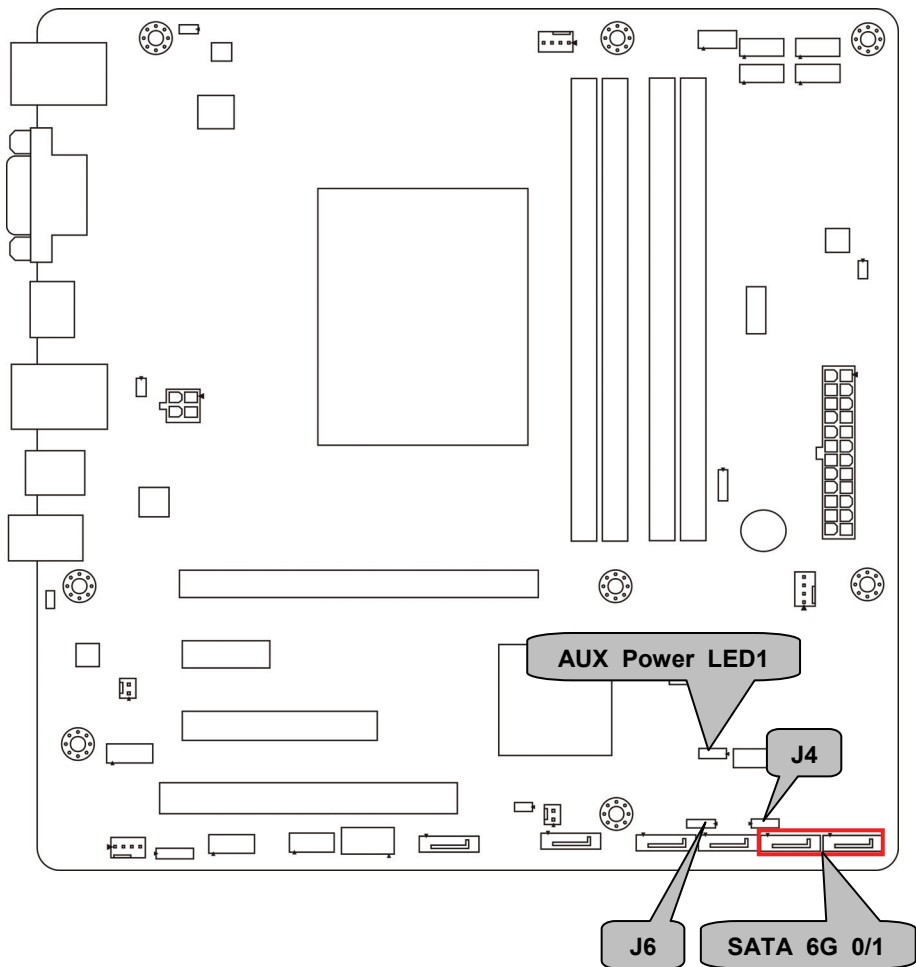
	Pin	1	2	3	4
	Signal	+5V	USB D-	USB D+	GND

J13: SPDIF Header

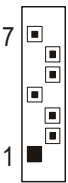
	Pin	1	2	3	4
	Signal	GND	SPDIF_OUT	KEY-Pin	VCC

SATA_2/SATA_3/SATA_4/SATA_5: SATA2.0 Connector


	1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable. NOTE: SATA_5 can support SATA DOM Device.
	2	SATA TX DP	
	3	SATA TX DN	
	4	GND	
	5	SATA RX DN	
	6	SATA RX DP	
	7	GND	




SATA_6G_0/SATA_6G_1: SATA3.0 Connector

	1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.
	2	SATA TX DP	
	3	SATA TX DN	
	4	GND	
	5	SATA RX DN	
	6	SATA RX DP	
	7	GND	



J83: Speaker Header

	Pin	1	2	3	4
	Signal	5VSB	KEY-Pin	SPKR_BUZZ_IN	SPKR_BUZZ



AUX_Power_LED1: Aux Power LED Header

	Pin	1	2	3
	Signal	GRN_BLNK_HRD	KEY-Pin	YLW_BLNK_HRD

J4: Clear CMOS Jumper

 <p>Clear CMOS</p>	<p>You can reset CMOS by using this jumper if you have forgotten your system/setup password or need to clear BIOS setting.</p> <ol style="list-style-type: none"> 1. Power off system and disconnect both power connectors from the motherboard. 2. Use jumper cap to close Pin_1 and Pin_2 for seconds to Clear CMOS. 3. Put jumper cap back to Pin_2 and Pin_3 (default setting). 4. Reconnect power & power on system.
 <p>Normal (Default)</p>	

J6: ME Header

	Pin 1-2 Closed: Fresh ME Firmware
	Pin 2-3 Closed: Normal (Default)

2.4 Installing the Processor and Heat sink

The S5515 supported Intel® processors are listed in section **Hardware Specifications** on page 5. Check our website at <http://www.tyan.com> for latest processor support.

NOTE: MiTAC TYAN is not liable for damage as a result of operating an unsupported configuration.

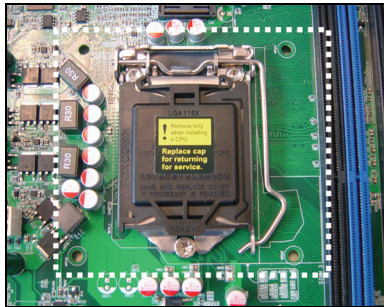
Processor Installation (SNB-DT Socket H2 LGA1155 for Intel CPU)

Follow the steps below to install the processors and heat sinks.

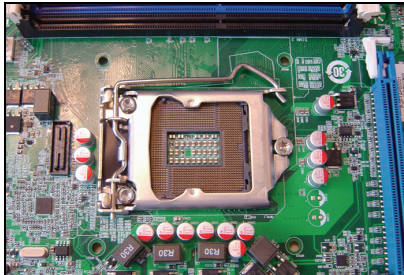
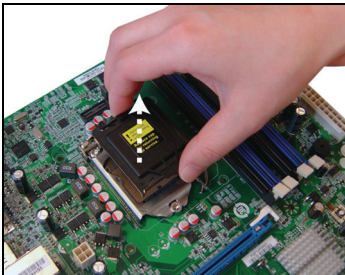
Please note that the illustrations are based on a SNB-DT Socket H2 LGA1155 which may not look exactly like the motherboard you purchased. Therefore, the illustrations should be held for your reference only.

NOTE: Please save and replace the CPU protection cap when returning for service.

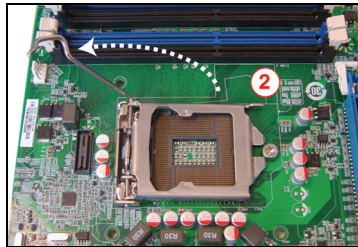
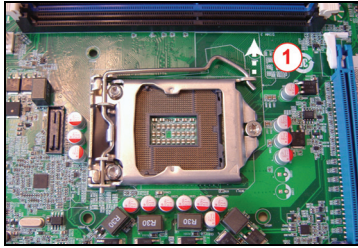
1. Locate the CPU socket.



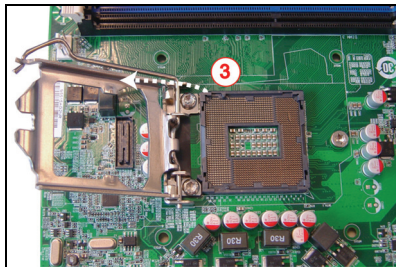
2. Take off the CPU protection cap.



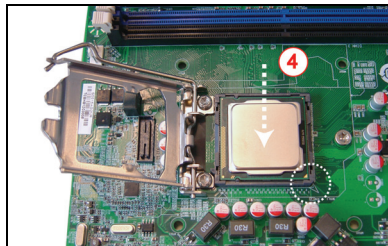
3. Pull the CPU lever slightly away from the socket and then push it to a fully open position.



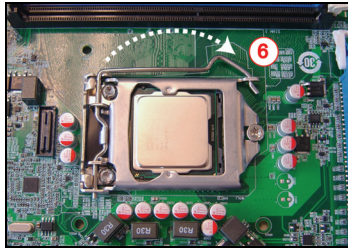
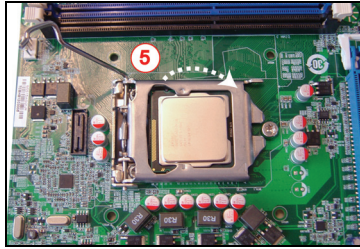
4. Lift the socket cover to a fully open position.



5. Place the CPU in the CPU socket and make sure that the gold arrow is located in the right direction with two notches properly aligned.



6. Close the socket cover and press the CPU socket lever down to lock the CPU in place.



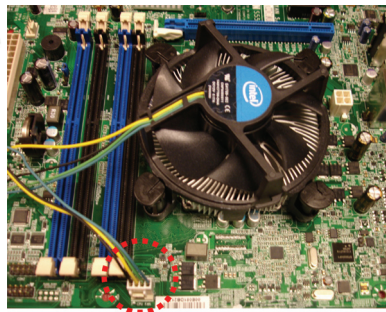
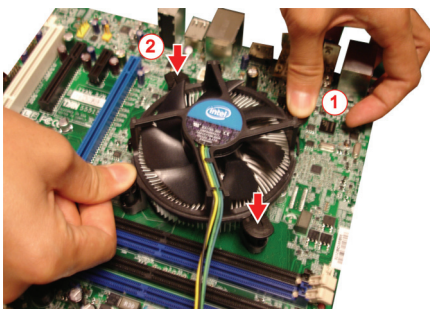
Heat sink Installation

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

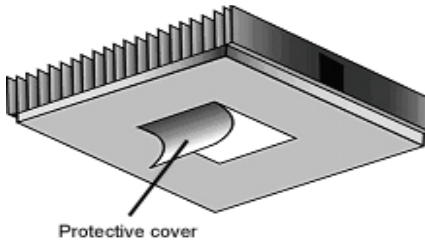
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: <http://www.intel.com>

The following diagram illustrates how to install the heatsink for the SNB-DT Socket H2 LGA1155.

7. Place the heat sink on top of the CPU and push the 4 latches in a diagonal pattern to lock it in place. Connect the fan cable to complete the installation.

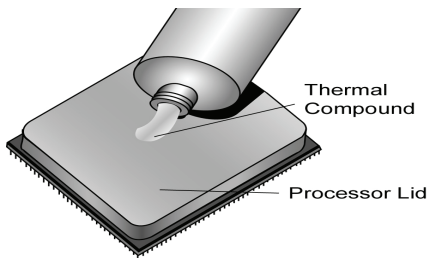


2.5 Thermal Interface Material



There are two types of thermal interface materials designed for use with the processors.

The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

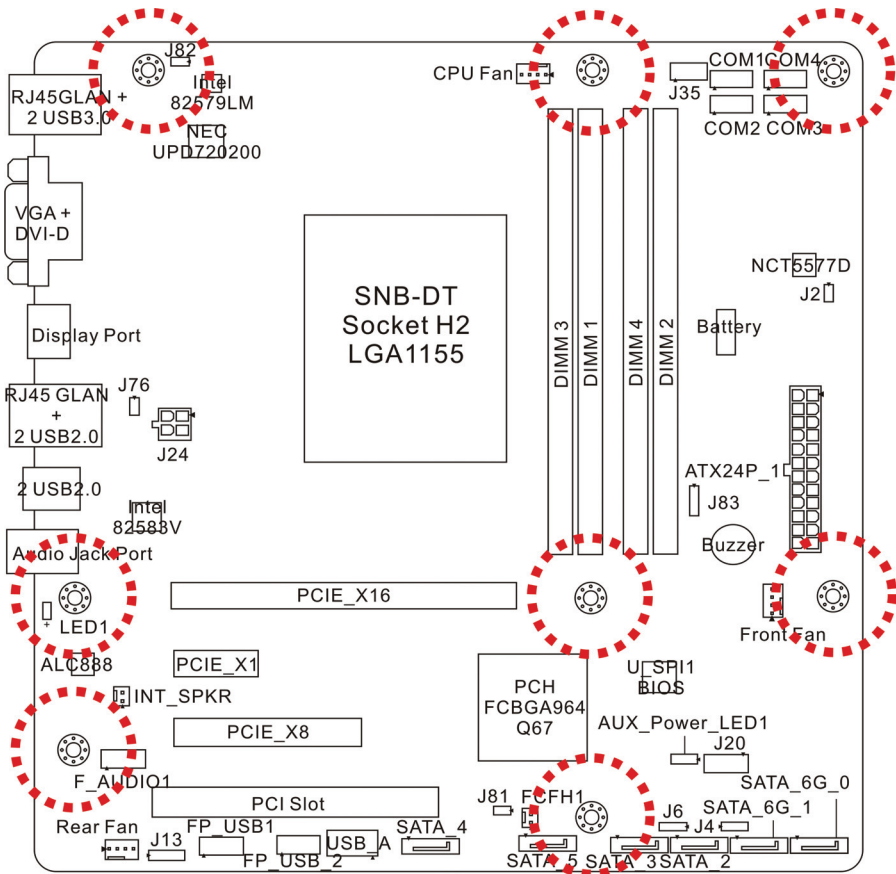


The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE: Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.6 Tips on Installing Motherboard in Chassis

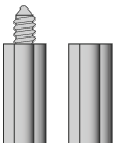
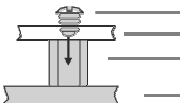
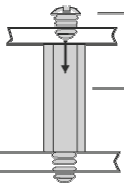
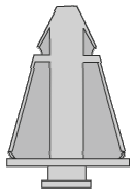
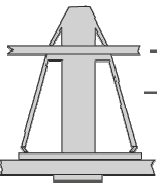
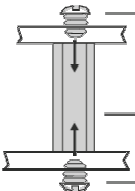
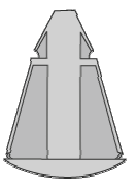
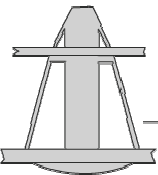
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

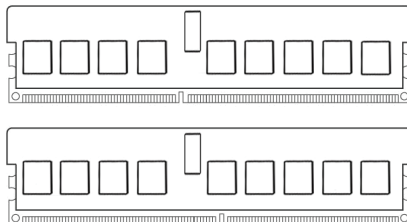
Mounting the Motherboard

Type	Solutions for installing	
	 <ul style="list-style-type: none">ScrewMotherboardStudChassis wall	 <ul style="list-style-type: none">ScrewMotherboardStudChassis wall
	 <ul style="list-style-type: none">MotherboardStandoffChassis wall	 <ul style="list-style-type: none">ScrewMotherboardStudChassis wallScrew
	 <ul style="list-style-type: none">MotherboardStandoffChassis wall	

2.7 Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at <http://www.tyan.com> for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR3 memory modules.



- Supports un-buffered non-ECC DDR3, at 1066 or 1333MHz speeds
- IVB CPU can support up to 1600MHz
- All installed memory will automatically be detected and no jumpers or settings need changing
- All memory must be of the **same type and density**

Recommended Memory Population Table

Quantity of memory installed	Single CPU Installed			
	1	2	3	4
DIMM1		√	√	√
DIMM2	√	√	√	√
DIMM3				√
DIMM4			√	√

NOTE:

1. √ indicates a populated DIMM slot.
2. Paired memory installation for Max performance.
3. Populate the same DIMM type in each channel, specifically
 - Use the same DIMM size
 - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs
5. Un-buffered DIMM can offer slightly better performance than registered DIMM if only a single DIMM per channel populated
6. We don't suggest other memory installation.

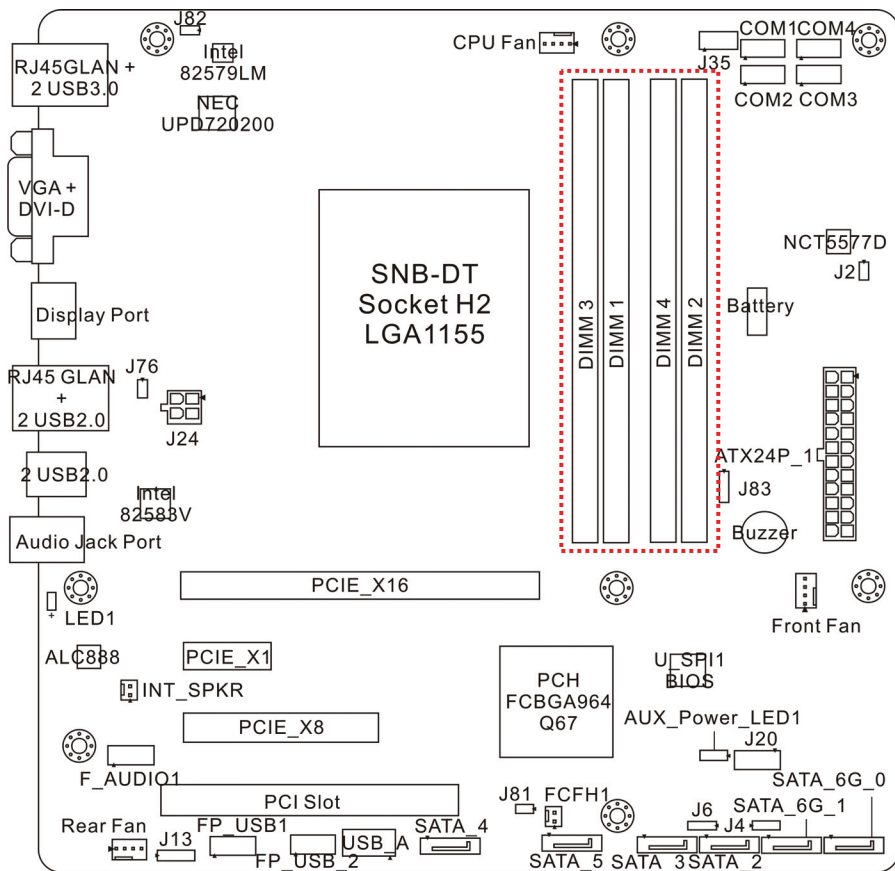
U-DIMM Module Support

DDR3 Speed/Voltage	DDR3 Rank Configuration	
1.5v	(DIMM1, DIMM2)	(DIMM3, DIMM4)
1066MHz		SR and DR
1066MHz	SR and DR	SR and DR
1333MHz		SR and DR
1333MHz	SR and DR	SR and DR
1600MHz		SR and DR
1600MHz	SR and DR	SR and DR

NOTES:

- UDIMM can support up to 8GB sized DIMM's
 - Maximum of 16GB per channel
 - SR and DR UDDR3 module support **only**
 - SR and DR 1.5v Memory MAX speed of 1333/1600* MHz in a dual channel configuration
- * IVB CPU can support up to 1600MHz.

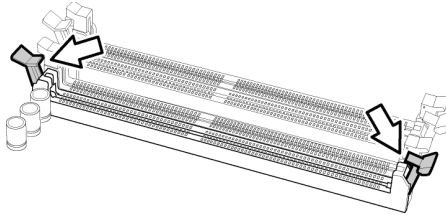
DIMM Location



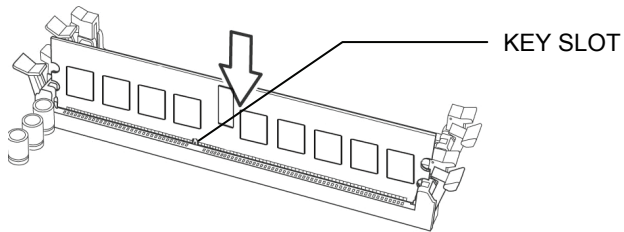
Memory Installation Procedure

Follow these instructions to install memory modules into the S5515.

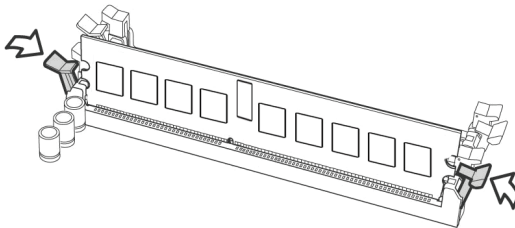
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.8 Attaching Drive Cables

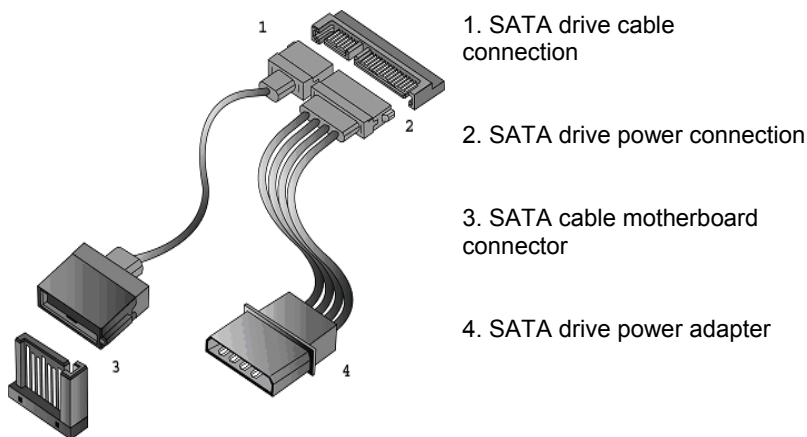
Attaching Serial ATA Cables

S5515 is equipped with **six (6)** Serial ATA (SATA) channel. Connections for the drives are very simple.

There is no need to set Master/Slave jumpers on SATA drives.

If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive.



2.9 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

PCI-E x 16 slot



PCI-E x 8 slot



PCI-E x 1 slot



PCI 32bit slot



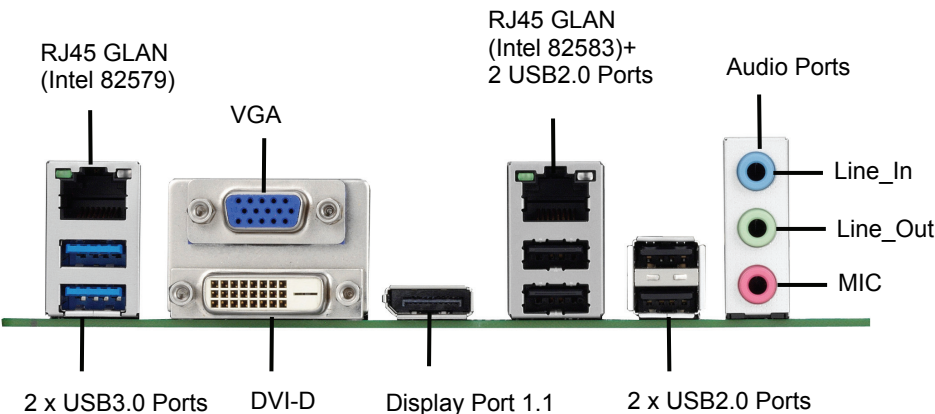
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

NOTE: You must always unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.10 Connecting External Devices


Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

Onboard LAN LED Color Definition


The **two** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
<div>LEFT RIGHT</div> 		Left LED	Right LED
10 Mbps	Link	Green	Amber
	Active	Blinking Green	Green
100 Mbps	Link	Green	Amber
	Active	Blinking Green	Green
1000 Mbps	Link	Green	Amber
	Active	Blinking Green	Green
No Link		Off	Off


2.11 Installing the Power Supply

There are **two (2)** power connectors on your S5515 motherboard. The S5515 supports EPS 12V power supply.

ATX24P_1: 24-Pin EPS 12V Power Main Connector

	Signal	Pin	Pin	Signal
	+3.3V	1	13	+3.3V
	+3.3V	2	14	-12V
	GND	3	15	GND
	+5V	4	16	PS ON#
	GND	5	17	GND
	+5V	6	18	GND
	GND	7	19	GND
	Power OK	8	20	Reserve
	+5VSB	9	21	+5
	+12V	10	22	+5
	+12V	11	23	+5
	+3.3V	12	24	GND

J24: 4-Pin EPS 12V Power Connector

	Signal	Pin	Pin	Signal
	GND	1	2	GND
	+12V	3	4	+12V

NOTE: You must unplug the power supply before plugging the power cables to motherboard connectors.

2.12 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press **** or **<F2>** during POST (**Del** on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Left/Right Arrow Keys	Change from one menu to the next
Up/Down Arrow Keys	Move between selections
Enter	Open highlighted section
PgUp/PgDn Keys	Change pages
+/-	Change options
ESC	Exit

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**Enter**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.

The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit TYAN's website at <http://www.tyan.com> for the information of BIOS updating.

3.2 Main Menu

In this section, you can alter general features such as the date and time.

Note that the options listed below are for options that can directly be changed within the Main Setup screen.

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information				Choose the system default language	
BIOS Vendor		American Megatrends			
Core Version		x.x.x.x			
Compliance		UEFI x.x			
BIOS Version		TYAN S5515 BIOS Vx.xx			
Build Date and Time		MM/DD/YYYY xx:xx:xx			
System Language		[English]		→←: Select screen	
System Date		[xxx MM/DD/YYYY]		↑ ↓ : Select item	
System Time		xx:xx:xx		Enter: Select	
Access Level		Administrator		+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	

BIOS Information

It displays the BIOS vendor, core version, compliance, date and time of BIOS build and the version of BIOS.

System Language

Choose the system default language.

System Date / Time

Adjust the system date.

MM (Months): DD (Days): YYYY (Years)

System Date / Time

Adjust the system clock.

HH (24 hours format): MM (Minutes): SS (Seconds)

Access Level

Read only.

3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main	Advanced
Chipset Boot Security Save & Exit	
▶ ACPI Settings ▶ S5 RTC Wake Settings ▶ CPU Configuration ▶ SATA Configuration ▶ USB Configuration ▶ Info Report Configuration ▶ Super IO Configuration ▶ Hardware Health Configuration ▶ Serial Port Console Redirection ▶ CPU PPM Configuration ▶ Onboard Device Configuration	System ACPI Parameters. →←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

ACPI Settings

System ACPI Parameters.

S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

CPU Configuration

CPU Configuration Parameters.

SATA Configuration

SATA Device Options Settings.

USB Configuration

USB Configuration Parameters.

Info Report Configuration

Info Report Configuration.

Super IO Configuration

System Super IO Chip Parameters.

Hardware Health Configuration

Hardware Health Configuration Parameters.

Serial Port Console Redirection

Serial Port Console Redirection.

CPU PPM Configuration

CPU PPM Configuration Parameters.

Onboard Device Configuration

Onboard Device Configuration.

3.3.1 ACPI Settings

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
ACPI Settings		Enable or disable ACPI Auto Configuration.
Enable ACPI Auto Configuration [Disabled]		→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Enable Hibernation	[Enabled]	
ACPI Sleep State	[Both S1 and S3 ava...]	
Lock Legacy Resources	[Disabled]	
S3 Video Repost	[Disabled]	

Enable ACPI Auto Configuration

Enable or disable ACPI Auto Configuration.

Disabled / Enabled

Enable Hibernation

Enable or disable System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

Enabled / Disabled

ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

Both S1 and S3 available for OS to choose from / S1 only (CPU Stop Clock) / S3 only (Suspend to RAM) / Suspend Disabled

Lock Legacy Resources

Enable or disable Lock Legacy Resources.

Disabled / Enabled

S3 Video Repost

Enable or disable S3 Video Repost.

Disabled / Enabled

3.3.2 S5 RTC Wake Settings

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
Wake System with Fixed Time	[Disabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified. →←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Wake System with Dynamic Time	[Disabled]	

Wake System with Fixed Time

Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified.

Disabled / Enabled

Wake System on Dynamic Time

Enable or disable System wake on alarm event. When enabled, System will wake on the current time + Increase minute(s).

Disabled / Enabled

3.3.3 CPU Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
CPU Configuration		Socket specific CPU Information
Intel® CPU@ x.xxGHz		
CPU Signature	xx	
Microcode Patch	xx	
Max CPU Speed	xx	
Min CPU Speed	xx	
CPU Speed	xx	
Processor Cores	xx	
Intel HT Technology	xx	
Intel VT-x Technology	xx	
Intel SMX Technology	xx	
64-bit	xx	
L1 Data Cache	xx	
L1 Code Cache	xx	
L2 Cache	xx	
L3 Cache	xx	
Hyper-Threading	[Enabled]	→←: Select screen
Active Processor Cores	[All]	↑ ↓: Select item
Limit CPUID Maximum	[Disabled]	Enter: Select
Execute Disable Bit	[Enabled]	+/-: Change Opt.
Intel Virtualization Technology	[Enabled]	F1: General Help
Hardware Prefetcher	[Enabled]	F2: Previous Values
Adjacent Cache Line Prefetch	[Enabled]	F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

CPU Information

Read only.

Hyper-Threading

Enabled for Windows XP and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology). When disabled only one thread per enabled core is enabled.

Enabled / Disabled

Active Processor Cores

Number of cores to enable in each processor package.

All / 1 / 2 / 3

Limit CPUID Maximum

Disabled for Windows XP.

Disabled / Enabled

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).

Enabled / Disabled

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Enabled / Disabled

Hardware Prefetcher

To turn on/off the Mid Level Cache (L2) streamer prefetcher.

Enabled / Disabled

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

Enabled / Disabled

3.3.4 SATA Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
SATA Controller(s)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[AHCI]	
Serial ATA Port 0	Empty	
Port 0	[Enabled]	
Hot Plug	[Enabled]	
Serial ATA Port 1	Empty	
Port 1	[Enabled]	
Hot Plug	[Enabled]	
Serial ATA Port 2	Empty	
Port 2	[Enabled]	
Hot Plug	[Enabled]	
Serial ATA Port 3	Empty	→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Port 3	[Enabled]	
Hot Plug	[Enabled]	
Serial ATA Port 4	Empty	
Port 4	[Enabled]	
Hot Plug	[Enabled]	
Serial ATA Port 5	Empty	
Port 5	[Enabled]	
Hot Plug	[Enabled]	

SATA Controller(s)

Enable or disable SATA Device.

Enabled / Disabled

SATA Mode Selection

Determine how SATA Controller(s) operate.

AHCI / IDE / RAID

Serial ATA Port 0/1/2/3/4/5

Read only.

Port 0/1/2/3/4/5

Enable or disable SATA Port.

Enabled / Disabled

Hot Plug

Designate this port as Hot Pluggable.

Enabled / Disabled

3.3.5 USB Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main	Advanced Chipset Boot Security Save & Exit
USB Configuration	Enables legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
USB Devices: 1 keyboard, 2 Hubs	
Legacy USB Support	[Enabled]
EHCI Hand-off	[Disabled]
Port 60/64 Emulation	[Enabled]
USB hardware delays and time-outs:	→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
USB transfer time-out	[20 sec]
Device reset time-out	[20 sec]
Device power-up delay	[Auto]

Legacy USB Support

Enable legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Enabled / Disabled / Auto

EHCI Hand-off

This is a workaround for OSes with EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Disabled / Enabled

Port 60/64 Emulation

Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

Enabled / Disabled

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

20 sec / 10 sec / 5 sec / 1 sec

Device reset time-out

USB mass storage device Start Unit command time-out.

20 sec / 10 sec / 30 sec / 40 sec

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. "AUTO" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Auto / Manual

3.3.6 Info Report Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
Info Report Configuration		Post Report Support Enabled/Disabled
Post Report		
Post Report	[Enabled]	→←: Select screen
Delay Time	[5]	↑ ↓ : Select item
Summery Screen		Enter: Select
Summery Screen	[Disabled]	+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Post Report

Post Report Support Enabled/Disabled.

Enabled / Disabled

Delay Time

Post Report Wait Time: 0 ~ 10 Seconds

5 / 0 / 1 / 2 / 3 / 4 / 6 / 7 / 8 / 9 / 10 / Until Press ESC

Summery Screen

Summery Screen Support Enabled/Disabled.

Disabled / Enabled

3.3.8 Hardware Health Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc. Main Advanced Chipset Boot Security Save & Exit	
Hardware Health Configuration Auto Fan Control [Disabled] Hardware Health Event Monitoring ▶ Sensor Data Register Monitoring	Auto Fan Control Help →←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Auto Fan Control

Auto Fan Control Help.

Disabled / Enabled

3.3.8.1 Sensor Data Register Monitoring

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
PC Health Status		
CPU DTS Temp	xx	
CPU below Tmax	xx	
CPU MOS Area	xx	
PCI-E Ambient	xx	
PCH Area	xx	
DIMM Ambient	xx	
CPU_Fan	xx	→←: Select screen
Front_Fan	xx	↑↓: Select item
Rear_Fan	xx	Enter: Select
VCORE	xx	+/-: Change Opt.
VBAT	xx	F1: General Help
3.3V	xx	F2: Previous Values
5V	xx	F3: Optimized Defaults
12V	xx	F4: Save & Exit
	xx	ESC: Exit

Read only.

3.3.9 Serial Port Console Redirection

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
COM1 Console Redirection ▶ Console Redirection Settings	[Disabled]	Console Redirection Enable or disable.
COM2 Console Redirection ▶ Console Redirection Settings	[Disabled]	
COM3 Console Redirection ▶ Console Redirection Settings	[Disabled]	
COM4 Console Redirection ▶ Console Redirection Settings	[Disabled]	→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Serial Port for Out-Of-Band Management/ Windows Emergency Services (EMS) Console Redirection ▶ Console Redirection Settings	[Disabled]	

Console Redirection

Console redirection enable or disable.

Disabled / Enabled

Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)

Console Redirection

Console redirection enable or disable.

Disabled / Enabled

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

3.3.9.1 Console Redirection Settings

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
COM1 Console Redirection Settings	Emulation: ANSI: Extended ASCII char. set. VT100: ASCII char. set. VT100+: Extends VT100 to support color, function keys etc. VT-UTF8: uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Terminal Type	[ANSI]
Bits per Second	[115200]
Data Bits	[8]
Parity	[None]
Stop Bits	[1]
Flow Control	[None]
VT-UTF8 Combo Key Support	[Enabled]
Recorder Mode	[Disabled]
Resolution 100x31	[Disabled]
Legacy OS Redirection Resolution	[80x24]
Putty KeyPad	[VT100]
	→←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Terminal Type

Emulation: ANSI: Extended ASCII char. set. VT100: ASCII char. set. VT100+: Extends VT100 to support color, function keys etc. VT-UTF8: uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

ANSI / VT-UTF8 / VT100 / VT100+

Bits per Second

Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

115200 / 57600 / 38400 / 19200 / 9600

Data Bits

Data Bits.

8 / 7

Parity

A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.

None / Even / Odd / Mark / Space

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

1 / 2

Flow Control

Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

VT-UTF8 Combo Key Support

Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

Enabled / Disabled

Recorder Mode

On this mode enabled only text will be sent. This is to capture Terminal data.

Disabled / Enabled

Resolution 100x31

Enable or disable extended terminal resolution.

Disabled / Enabled

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.

80x24 / 80x25

Putty KeyPad

Select Function Key and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

3.3.9.2 Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection Settings

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
Out-of-Band Mgmt Port Terminal Type [COM1] Bits per Second [VT-UTF8] Flow Control [115200] Data Bits [None] Parity 8 Stop Bits None 1		Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port. → ←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Out-of-Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

COM1 / COM2 / COM3 / COM4

Terminal Type

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

VT-UTF8 / VT100 / VT100+ / ANSI

Bits per Second

Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

115200 / 9600 / 19200 / 57600

Flow Control

Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS / Software Xon/Xoff

Data Bits / Parity / Stop Bits

Read only.

3.3.10 CPU PPM Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
CPU PPM Configuration		Enable/Disable Intel SpeedStep.
EIST	[Enabled]	→←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Turbo Mode	[Enabled]	
CPU C3 Report	[Enabled]	
CPU C6 Report	[Enabled]	
CPU C7 Report	[Enabled]	

EIST

Enable/Disable Intel SpeedStep.

Enabled / Disabled

Turbo Mode

Turbo Mode.

Enabled / Disabled

CPU C3 Report

Enable/Disable CPU C3 (ACPI C2) report to OS.

Enabled / Disabled

CPU C6 Report

Enable/Disable CPU C6 (ACPI C3) report to OS.

Enabled / Disabled

CPU C7 Report

Enable/Disable CPU C7 (ACPI C3) report to OS.

Enabled / Disabled

3.3.11 Onboard Device Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main	Advanced Chipset Boot Security Save & Exit
Onboard Device Configuration	Enabled/Disabled the LAN Option ROM in the Chipset.
LAN1 Option ROM	[Disabled]
LAN2 Option ROM	[Disabled]
	→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

LAN1 Option ROM

Enabled/Disabled the LAN Option ROM in the Chipset.

Disabled / PXE / iSCSI

LAN2 Option ROM

Enabled/Disabled the LAN Option ROM in the Chipset.

Disabled / PXE

3.4 Chipset Menu

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
▶ South Bridge ▶ North Bridge ▶ WatchDog Timer Configuration	North Bridge Parameters
	→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

South Bridge

South Bridge Parameters.

North Bridge

North Bridge Parameters.

WatchDog Timer Configuration

WatchDog Timer Configuration.

3.4.1 South Bridge

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
DeepSx Power Policies			[Disabled]		
High Precision Event Timer Configuration					
High Precision Timer			[Enabled]		
SLP_S4 Assertion Width			[4-5 Seconds]		
Restore AC Power Loss			[Power Off]		
Chassis Intrusion Detection			[Disabled]		
			Configure the DeepSx Mode Configuration. WOL wake up function would not usable when users enable Sx function.		
			→←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		

DeepSx Power Policies

Configure the DeepSx Mode Configuration. WOL wake up function would not usable when users enable Sx function. Note : Mobile platforms support Deep S4/S5 in DC only and Desktop platforms support Deep S4/S5 in AC only.

Disabled / Enabled in S5 / Enabled in S4-S5

High Precision Timer

Enable or disable the High Precision Event Timer.

Enabled / Disabled

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

4-5 Seconds / 1-2 Seconds / 2-3 Seconds / 3-4 Seconds / Disabled

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

Power Off / Power On / Last State

Chassis Intrusion Detection

Enabled: When a chassis open event is detected, the BIOS will display the event.

Disabled / Enabled

3.4.2 North Bridge

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc. Main Advanced Chipset Boot Security Save & Exit			
VT-d [Enabled]		Check to enable VT-d function on MCH.	
▶ Graphics Configuration ▶ DMI Configuration ▶ NB PCIe Configuration ▶ Memory Configuration		→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	

VT-d

Check to enable the VT-d function on MCH.

Enabled / Disabled

3.4.2.1 Graphics Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
Initiate Graphic Adapter Intel Internal Graphic IGD Memory ▶ LCD Control		[Auto] [Auto] [64M] Select which of IGFX/PEG/PCI Graphics device should be Primary Display or select SG for Switchable Gfx. →←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Initiate Graphic Adapter

Select which of IGFX/PEG/PCI Graphics device should be Primary Display or select SG for Switchable Gfx.

Auto / IGFX / PEG / PCI

Intel Internal Graphic

Keep IGD enabled based on the setup options.

Auto / Disabled / Enabled

IGD Memory

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

64M / 32M / 96M / 128M / 160M / 192M / 224M / 256M / 288M / 320M / 352M / 384M / 416M / 448M / 480M / 512M / 1024M

3.4.2.1.1 LCD Control

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
Boot	Security	Save & Exit
LCD Control		Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA mode will be supported only on primary display.
Primary IGFX Boot Display	[VBIOS Default]	
LCD Panel Type	[VBIOS Default]	→←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Primary IGFX Boot Display

Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA mode will be supported only on primary display.

VBIOS Default / CRT / EFP / LFP / EFP3 / EFP2 / LFP2

LCD Panel Type

Select LCD panel used by Internal Graphic Device by selecting the appropriate setup item.

VBIOS Default / 640x480 LVDS / 800x600 LVDS / 1024x768 LVDS1 / 1280x1024 LVDS / 1400x1050 (RB) LVDS1 / 1400x1050 LVDS2 / 1600x1200 LVDS / 1366x768 LVDS / 1680x1050 LVDS / 1920x1200 LVDS / 1440x900 LVDS / 1600x900 LVDS / 1024x768 LVDS2 / 1280x800 LVDS / 1920x1080 LVDS / 2048x1536 LVDS

3.4.2.2 DMI Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
DMI Configuration		Enable or disable DMI Vc1
DMI	x4 Gen2	
DMI Vc1 Control	[Enabled]	→←: Select screen
DMI Vcp Control	[Enabled]	↑ ↓: Select item
DMI Vcm Control	[Enabled]	Enter: Select
DMI Link ASPM Control	[L0sL1]	+/-: Change Opt.
DMI Extended Synch Control	[Disabled]	F1: General Help
DMI Gen 2	[Auto]	F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

DMI Vc1 Control

Enable or disable DMI Vc1.

Enabled / Disabled

DMI Vcp Control

Enable or disable DMI Vcp.

Enabled / Disabled

DMI Vcm Control

Enable or disable DMI Vcm.

Enabled / Disabled

DMI Link ASPM Control

Enable or disable the control of Active State Power Management on SA side of the DMI Link.

L0sL1 / L0s / L1 / Disabled

DMI Extended Synch Control

Enable DMI Extended Synchronization.

Disabled / Enabled

DMI Gen 2

Enable or disable DMI Gen 2. Auto means Disabled for IVB A0 MB/DT and IVB B0 MB. Enabled for other CPUs.

Auto / Disabled / Enabled

3.4.2.3 NB PCIe Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
NB PCIe Configuration		
PEG0I	Not present	Configure PEG0 B0:D1:F0 Gen1-Gen3
PEG0 --- Gen X	[Auto]	
PEG0 ASPM	[Auto]	
Enable PEG	[Auto]	→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

PEG0 --- Gen X

Configure PEG0 B0:D1:F0 Gen1-Gen3.

Auto / Gen1 / Gen2 / Gen3

PEG0 ASPM

Control ASPM support for the PEG: Device 1 Function 0. This has no effect if PEG is not the currently active device.

Auto / Disabled / ASPM L0s / ASPM L1 / ASPM L0sL1

Enable PEG

Enable or disable the PEG.

Auto / Enabled / Disabled

3.4.2.4 Memory Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
Memory Information		Select DIMM timing profile that should be used.
Memory RC Version	xx	→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Memory Frequency	xx	
Total Memory	xx	
Memory SlotA0	xx	
Memory SlotA1	xx	
CAS Latency (tCL)	xx	
Minimum Delay Time	xx	
CAS to RAS (tRCDmin)	xx	
Row Precharge (tRPmin)	xx	
Active to Precharge (tRASmin)	xx	
XMP Profile 1	xx	
XMP Profile 2	xx	
DIMM profile	[Default DIMM profile]	
Memory Frequency Limiter	[Auto]	

Memory Information

Read only.

DIMM profile

Select DIMM timing profile that should be used.

Default DIMM profile / Custom Profile / XMP Profile 1 / XMP Profile 2

Memory Frequency Limiter

Maximum Memory Frequency Selection in Mhz.

Auto / 1067 / 1333 / 1600 / 1867 / 2133 / 2400 / 2667

3.4.3 WatchDog Timer Configuration

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
Boot	Security	Save & Exit
Watch Dog Mode Watch Dog Timer		Watch Dog Mode Help
[Disabled] [2MINS]		→←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Watch Dog Mode

Watch Dog Mode Help.

Disabled / POST / OS / PowerON

NOTE: When **Watch Dog Mode** is set to [Disabled], the following item will not appear.

Watch Dog Timer

Watch Dog Timer Help.

2 MINS / 4 MINS / 6 MINS / 8 MINS / 10 MINS

3.5 Boot

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main Advanced Chipset Boot Security Save & Exit		
Boot Configuration		Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Setup Prompt Timeout	[2]	
Bootup NumLock State	[On]	
Quiet Boot	[Disabled]	
GateA20 Active	[Upon Request]	→←: Select screen ↑ ↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Option ROM Messages	[Force BIOS]	
INT19 Trap Response	[Immediate]	
Endless Boot	[Disabled]	
Boot Option Priorities		
Boot Option #1	[UEFI: Built-in EFI...]	
▶ CSM parameters		

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Range: 1~65535

2

Bootup NumLock State

Select the keyboard NumLock state.

On / Off

Quiet Boot

Enable or disable Quiet Boot option.

Disabled / Enabled

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.

ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Upon Request / Always

Option ROM Messages

Select display mode for Option ROM.

Force BIOS / Keep Current

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during the legacy boot.

Immediate / Postponed

Endless Boot

Enable or disable Endless Boot.

Disabled / Enabled

Boot Option #1

Set the system boot order.

UEFI: Built-in EFI Shell / Disabled

3.5.1 CSM Parameters

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
Launch CSM Boot option filter Launch PXE OpROM policy Launch Storage OpROM policy Launch Video OpROM policy		[Always] [UEFI and Legacy] [Legacy only] [Legacy only] [Legacy only]
		This option controls if CSM will be launched. →←: Select screen ↑ ↓ : Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Launch CSM

This option controls if CSM will be launched.

Always / Auto / Never

Boot option filter

This option controls what devices system can boot to.

UEFI and Legacy / Legacy only / UEFI only

Launch PXE OpROM policy

Control the execution of UEFI and Legacy PXE OpROM.

Legacy only / Do not launch / UEFI only

Launch Storage OpROM policy

Control the execution of UEFI and Legacy Storage OpROM.

Legacy only / Do not launch / UEFI only

Launch Video OpROM policy

Control the execution of UEFI and Legacy Video OpROM.

Legacy only / Do not launch / UEFI only

3.6 Security

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc. Main Advanced Chipset Boot Security Save & Exit					
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length 3 Maximum length 20 Administrator Password User Password			Set Administrator Password		
			→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		

Administrator Password

Set administrator password in the **Create New Password** window. After you key in the password, the **Confirm New Password** window will pop out to ask for confirmation.

User Password

Set user password in the **Create New Password** window. After you key in the password, the **Confirm New Password** window will pop out to ask for confirmation.

3.7 Save & Exit

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	Exit system setup after saving the changes.
Save Options Save Changes Discard Changes	→←: Select screen ↑↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Restore Defaults Save as User Defaults Restore User Defaults	
Boot Override UEFI: Built-in EFI Shell	

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Options

Read only.

Save Changes

Save changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Restore Defaults

Restore/Load Default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

NOTE

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at <http://www.tyan.com>.

4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at <http://www.tyan.com>

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.2 AMIBIOS Post Code (Aptio)

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	Sec errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Note used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not found

SEC Beep Codes

None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PCI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started.
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode(SMM) initialization
0x37	Post-Memory North Bridge initialization is started.

Status Code	Description
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE PIL is started
PCI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed.
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed.
0x5A	Internal CPU error
0x5B	Reset PPI is not available.
0x5C – 0x5F	Reserved for future AML error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL).
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AML progress codes
S3 Resume Error Codes	
0xE8	S3 Resume failed
0xE9	S3 Resume PPI not found
0xEA	S3 Resume Boot Script error
0xEB	S3 OS wake error
0xEC – 0xEF	Reserved for future AML error codes

Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found.
0xF4	Recovery firmware image is loaded.
0xF5 – 0xF7	Reserved for future AML progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available.
0xF9	Recovery capsule is not found.
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AML error codes

PEI Beep Codes

# of Beeps	Description
1 (repeatedly)	Memory not installed
1	Memory was installed twice (installPEIMemory routine in PEI Core called twice).
2	Recovery started
3	DXE IPL was not found.
3	DXE Core Firmware Volume was not found.
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available.

DXE Phase

Status Code	Description
0x60	DXE Core is started.
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started.
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started.
0x6A	North Bridge DXE SMM initialization is started.
0x6B	North Bridge DXE initialization (North Bridge module specific)

Status Code	Description
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started.
0x71	South Bridge DXE SMM initialization is started.
0x72	South Bridge devices initialization
0x73	South Bridge DXE initialization (South Bridge module specific)
0x74	South Bridge DXE initialization (South Bridge module specific)
0x75	South Bridge DXE initialization (South Bridge module specific)
0x76	South Bridge DXE initialization (South Bridge module specific)
0x77	South Bridge DXE initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller initialization
0x94	PCI Bus Enumeration
0x95	PCI BUS Request Resources
0x96	PCI Bus Assign Resources
0x97	Console output devices connect
0x98	Console Input devices connect
0x99	Super IO initialization
0x9A	USB initialization is started.
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E -0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started.

Status Code	Description
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
0xD7	No Console Input Devices are found.
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error).
0xDB	Flash update is failed.
0xDC	Reset protocol is not available.

DXE Beep Codes

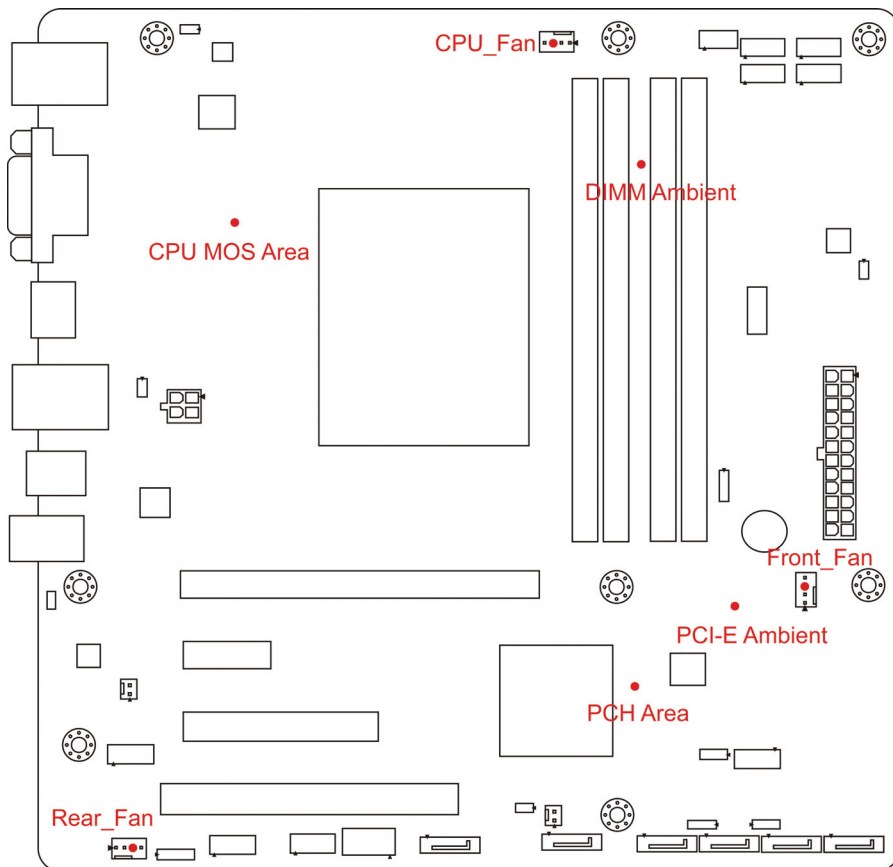
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available.
5	No Console Output Devices are found.
5	No Console Input Devices are found.
6	Flash update is failed.
7	Reset protocol is not available.
8	Platform PCI resource requirements cannot be met.

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state.
0x02	System is entering S2 sleep state.
0x03	System is entering S3 sleep state.
0x04	System is entering S4 sleep state.
0x05	System is entering S5 sleep state.
0x10	System is waking up from the S1 sleep state.
0x20	System is waking up from the S2 sleep state.
0x30	System is waking up from the S3 sleep state.
0x40	System is waking up from the S4 sleep state.
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.



NOTE: The red dot indicates the sensor.

Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the **third** pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: **CPU MOS Area**, **PCH Area**, **DIMM Ambient** and **PCI-E Ambient**. They detect the system temperature around.
NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:

Aptio Setup Utility --- Copyright © 2011 American Megatrends, Inc.	
Main	Advanced Chipset Boot Security Save & Exit
PC Health Status	
CPU DTS Temp	xx
CPU below Tmax	xx
CPU MOS Area	xx
PCI-E Ambient	xx
PCH Area	xx
DIMM Ambient	xx
CPU_Fan	xx
Front_Fan	xx
Rear_Fan	xx
VCORE	xx
VBAT	xx
3.3V	xx
5V	xx
12V	xx
	xx
→←: Select screen ←↓: Select item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	

BIOS Temp Sensor	Name Explanation
CPU DTS Temp	Temperature of the CPU Digital Temperature Sensor
CPU below Tmax	Temperature Range below CPU allowable Tmax
CPU MOS Area	Temperature of the CPU MOS Area
PCI-E Ambient	Temperature of the PCI-E Area
PCH Area	Temperature of the PCH Area
DIMM Ambient	Temperature of the DIMM Area
CPU_Fan	Fan Speed of CPU_Fan
Front_Fan	Fan Speed of Front_Fan
Rear_Fan	Fan Speed of Rear_Fan

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which loses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at <http://www.tyan.com>

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 10 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN can help. Besides designing innovative and quality products for over a decade, TYAN has continuously offered customers service beyond their expectations. TYAN's website (www.tyan.com) provides easy-to-access FAQ searches and online Trouble Ticket creation as well as Instant Chat capabilities with our Support Agents. TYAN also provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: <http://www.tyan.com>
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group:
alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE:

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

**Notice for the USA**

Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Plug the equipment into an outlet on a circuit different from that of the receiver.

Consult the dealer on an experienced radio/television technician for help.

Notice for Canada

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux normes de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'interference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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